REMARKS

Upon entry of the present amendment, Claims 1-15 are pending in the application, of which claims 1, 6, and 9 are independent.

After careful consideration of the objections and rejections set forth in the Office Action, applicant respectfully submits that as amended, all pending claims patentably distinguish over the art of record, and requests allowance of all pending claims, as discussed further below.

Claims 3 and 6 have been amended herein to correct minor informalities. In both claims 3 and 6, the bore was recited as tapered, and then later in the same claim was referred to as the "cylindrical bore". Claims 3 and 6 have been amended herein to recite the shape of the bore as "tapered" consistently throughout. Claim 6 has also been amended to replace "end" and "hose" with "ends" and "hoses" so as to be in grammatical agreement with the cited plurality of drain hoses.

Claim rejections under 35 USC 102

Claims 1 and 2 have been rejected under 35 USC 102 (b) as anticipated by Logan et al. The Examiner states that Logan discloses a cooling system for a watercraft including drain hoses, and a drain port 25 with a valve 1.

Logan discloses a drain valve for a marine engine comprising a cylindrical housing 1 which includes several inlet nipples 5 extending from one side for connection with plural hoses. The hoses extend from the valve to various portions of the cooling system to drain water therefrom to the valve. A tapered resilient valve member 8 is positioned for engagement with each respective inlet 5. Each valve member 8 is mounted on a common piston assembly 9, 17. The piston assembly is movable within the housing 1, and is configured to be spring biased to a position in

which valves 8 are automatically closed at temperatures above a certain level, and to a position in which the valves 8 are automatically opened when temperatures are below the certain level. When the valves 8 are open, fluid enters the housing 1 and drains via an outlet 24, 25 formed at a lower end of the housing 1.

The main housing 1 disclosed by Logan is a flattened cylinder, which is wider than the axial length thereof.

Logan uses a spring-loaded piston assembly to automatically maintain the plugs in relation to the inlet, whereas the applicant manually secures the plug to the housing using cooperating portions provided on both the plug and the housing.

Claim 1 has been amended herein to overcome rejection under Logan. Specifically, the claim has been amended to require that the valve be manually operable. Language has also been added to claim 1 to require that the valve comprises a hollow elongated main body and a plug which fits inside of said main body, said plug being manually removable from said main body to allow water to drain outwardly therefrom. This limitation is not taught, suggested or rendered obvious by the references of record, considered either individually or in any reasonable combination thereof.

As regards claim 2, although Logan discloses a plurality of drain hoses, wherein each hose is in fluid communication with a drain valve, Logan fails to disclose a single drain valve for opening and closing the drain port and for simultaneously draining multiple drain hoses. Rather, Logan discloses a plurality of valves 8, each of which are inserted and withdrawn from a respective inlet 5. Although positioning of the valves 8 relative to the inlets 5 is accomplished by mounting the plural valves to a common piston assembly, each inlet represents a hose drain into the valve body of Logan.

As further regards claim 2, since this claim depends from claim 1, and since claim 1 has been amended to avoid rejection, claim 2 is considered to be in condition for allowance.

Claim rejections under 35 USC 103

Further in the above-identified Office Action, Claims 3-8 were rejected under 35 USC 103(a) as unpatentable over Logan et al in view of Nix et al. The Examiner stated that Logan does not disclose a valve with a tapered cylindrical portion and a tapered bore, and that Nix teaches a valve with a plug (38) and tapered portion (Fig 2) and a cylindrical bore (20). It is the Examiner's contention that it would have been obvious to form the valve of Logan with a plug and a tapered cylindrical portion with a cylindrical bore as taught by Nix for improved fluid flow and less noise.

Nix discloses a through-valve 10 having a housing including an inner tapered bore 20. The bore 20 of Nix is positioned within a fluid pipe for controlling fluid flow through the pipe. Nix also discloses a tapered rotatable valve element 38 which is positioned within the tapered bore 20. Valve element 38 has openings formed therein such that when the valve is rotated to a first position, the openings are aligned with the direction of fluid flow and flow through the pipe is unobstructed. When the valve of Nix is rotated to a second position, the openings are not aligned with the direction of fluid flow. Thus fluid flow through the valve is obstructed by a closed-face portion of the valve element 38, and further, fluid is prevented from flowing about the outer edges of the valve element because of close fit between the tapered surfaces of the valve element 38 and the bore 20.

The applicant disagrees with these rejections since the modification of Logan to include the tapered elements disclosed by Nix is not obvious. Even if the Logan and Nix references are assumed for the sake of argument to be combinable, the combination fails to teach applicant's claimed invention. The valves of Logan and Nix operate in different ways. The valve disclosed by Logan includes plural plug members that move linearly in an axial direction with respect to plural

inlet openings, such that in an open position they are spaced apart from the valve housing, and in a closed position they are in contact with the valve housing. The valve disclosed by Nix is rotary rather than linear, and thus requires an interaction between the tapered sides of the housing and plug to form a seal when in a plugged position. Further, the plug disclosed by Nix always remains in contact with the inner surface of the tapered housing, and moves in a circumferential direction with respect thereto. Thus there is no motivation for the modification of the structure of Logan in view of Nix due to their different modes of operation.

The cylindrical housing disclosed by Logan provides ample space for the longitudinal motion of the piston assembly. Modification of the housing disclosed by Logan to provide a tapered cylindrical portion with a cylindrical bore would be incompatible with the function of Logan's invention since it would interfere with the longitudinal motion of the piston assembly. Because the modification of Logan in view of Nix is not considered to be obvious, and because such a modification would render the invention of Logan inoperable, the applicant respectfully asserts that claims 3-8 are patentable over these references, both singly and in combination.

As regards claim 3, which recites a drain valve comprising a main body including a tapered cylindrical portion having a tapered bore formed therein, and a plurality of connecting pipes integrally attached to cylindrical portion and in fluid communication with the tapered bore, we disagree with this rejection since modification of the housing 1 of Logan to provide a tapered cylindrical housing having a tapered cylindrical bore, renders the device disclosed by Logan inoperable. For example, if the housing of Logan were modified to taper in the direction of the inlet nozzles, the spring loaded piston assembly, which has a cylindrical outer periphery, would be prevented from movement by interference with the tapered housing. If, on the other hand, the housing of Logan was modified to taper from top to bottom with respect to the view of Figure 1,

motion of the piston assembly would be similarly obstructed by the tapered sidewalls. Further, since the valve of Logan and the valve of Nix use very different types of obstruction means (for example, linear versus rotary) there is no reason for or benefit from providing such a modification.

As regards claims 4 and 7, which recite the drain valve comprising three connecting pipes, the applicant agrees that this feature is disclosed by Logan. However, since these claims depend from claims which are considered to be in condition for allowance, claims 4 and 7 are also considered to be in condition for allowance.

As regards claims 5 and 8, these claims recite that the drain valve comprises a plug having a tapered portion which fits sealingly within the tapered bore of the main body. Logan discloses the valve bodies 8 as having a tapered peripheral edge (col. 3, line 24), but discloses plural valve bodies within a cylindrical housing. The applicant disagrees with the modification of the housing of Logan in view of Nix, as discussed above with respect to claim 3, and therefore respectfully disagrees with the rejection of claims 5 and 8.

As regards claim 6, Logan discloses a plurality of drain hoses and a plurality of connecting pipes integrally attached to the housing, a drain port at one end of the hoses comprising a single drain openable and closable to regulate fluid flow therethrough, but does not disclose a single drain valve for opening and closing the port (plural valve bodies 8, for example), and further does not disclose a tapered housing having a tapered bore formed therein. The applicant disagree with the modification of the housing of Logan in view of Nix, as discussed above with respect to claim 3, and therefore respectfully disagree with the rejection of claim 6.

Other Matters

New claims 9-15 have been added to the application, of which claim 10 is independent

and claims 11-14 are dependent therefrom. Claim 9 depends from claim 6, and adds a limitation of sealing rings extending around a main shaft of the plug. Claim 10 includes the features recited in claim 6 and further includes a single tapered plug within body of the valve. This feature is not disclosed by Logan, which recites a plurality of plugs within the body of the valve. Although Nix discloses a tapered valve, the applicant respectfully submits that applicant's valve is patentably distinguishable from the teaching of Nix. Claim 11 is directed to a drain valve which includes a single outlet opening positioned at a lower end thereof and coincident with a longitudinal axis of the main housing. This is in contrast to both Logan and Nix, who both show fluid exit the bodies in a direction transverse to the axial direction of their respective housings. Claim 12 is directed to the connecting pipes are arranged upon the main housing so as to extend in a direction normal to an axial direction of the housing. Nix does not disclose connecting pipes, and the connecting pipes disclosed by Logan are aligned with the axial direction of the housing. Claim 13 is directed to the features of claims 11 and 12, as well as the feature of the plug being provided with plural circumferentially extending lips positioned so as to be spaced apart in the longitudinal direction. Such structure is not disclosed in the cited prior art. Claim 14 is directed to the plug secured within the housing by means of a connecting portion. This feature is also not disclosed in the cited prior art.

New claim 15 depends from claim 1, and adds further structural limitations regarding the main body and the plug.

All new claims are fully supported by the original specification, and no new matter has been added to the application by the present amendment, since all of the claim limitations were expressly or inherently disclosed by the original specification, including the drawings.

Conclusion

Based on all of the foregoing, applicant respectfully submits that all of the objections and rejections set forth in the Office Action are overcome, and that as presently amended, all of the pending claims are believed to be allowable over all of the references of record, whether considered singly or in combination.

Applicant requests reconsideration and withdrawal of the rejection of record, and allowance of the pending claims.

If the Examiner is not fully convinced of all of the claims now in the application, applicant respectfully requests that the Examiner telephonically contact applicant's undersigned representative to expeditiously resolve prosecution of the application.

Favorable consideration is respectfully requested.

Respectfully submitted,

Customer No. 21828
Carrier, Blackman & Associates, P.C.
24101 Novi Road, Suite 100
Novi, Michigan 48375
October 18, 2004

William D. Blackman
Attorney for Applicant
Registration No. 32,397
(248) 344-4422

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being transmitted, via facsimile, to Examining Group 3617 of the United States Patent and Trademark Office on October 18, 2004 , at the number (703) 872-9306.

WDB/kmm